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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,074	04/19/2004	Tomoki Nobuta	WAKAB76.006AUS	1881

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EXAMINER
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WANG, EUGENIA

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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03/13/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/827,074	<b>Applicant(s)</b> NOBUTA ET AL.	
	<b>Examiner</b> EUGENIA WANG	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 10-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/1/07, 12/05/07</u> .                                       | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the amendment filed January 14, 2008:
  - a. Claims 10-19 are pending.
  - b. The previous objection to the drawings is maintained.
  - c. The stylistic changes to the Specification are noted.
  - d. The previous art rejection is withdrawn. A new rejection is made in light of the amendment, thus the action is final.

### ***Information Disclosure Statement***

2. The information disclosure statements filed November 1, 2007 and December 5, 2007 have been placed in the application file and the information referred to therein has been considered as to the merits. (Note: Only the provided abstracts have been considered. For consideration of the full disclosures, Examiner invites Applicant to submit a translation of the full disclosures.)

### ***Drawings***

3. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

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applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance

***Response to Arguments***

4. Applicant's arguments filed January 14, 2008 have been fully considered but they are not persuasive.

Applicant argues that adding "Background Art" overcomes the objection.

Examiner respectfully disagrees. The terms "Prior Art" and "Background Art" are not commensurate in scope. The legend must read "Prior Art" for withdrawal of the objection.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 10-15, 18, and 19 are rejected under 35 U.S.C. 102(b) as anticipated by JP 2000-036305 (Hara) as evidenced by Handbook of Batteries (HoB).

As to claims 10, 11, 14, and 15, Hara teaches a lead-acid battery (electrochemical cell, as applied to claims 10 and 11 and storage device, as applied to claims 14 and 15), wherein the active material of the anode includes a sulfonated polystyrene resin (anion-exchange resin) made of fibers with a diameter (major axis) of 10 micrometers and an average length of 5 mm (abs; para 0011, lines 1-5). (It is noted that the sulfonated polystyrene resin inherently is an anion exchange resin, wherein the

basis of inherency lies in the fact that it is the same material embodied by the instant application. See p 20, lines 12-19 of the instant application.)

It is inherent that the lead-acid battery of Hara has the characteristics of a typical of both a battery (i.e. having a cathode, and anode, and an electrolyte), and furthermore the characteristics of a lead-acid battery. Although Hara does not specifically teach the electrode active materials and electrolyte of his lead acid battery, all lead-acid batteries inherently have the same general components in order to function as a lead acid battery, as evidenced by the HoB, below.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that a lead-acid battery, as taught by Hara, must have all of the components of a lead-acid battery (where HoB shows the materials and the electrochemical reaction of a typical lead-acid battery, as set forth below). Furthermore, the materials used within the examples of Hara indicate that the lead-acid battery is a typical lead acid battery. For example, lead powder is used in the anode and sulfuric acid is added (see para 0013). These materials are embodied in HoB as typical for lead acid batteries as anode

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materials and electrolyte materials, respectively (see section 24.2.1). Therefore, it is inherent that Hara's battery comprises of the materials as listed in the HoB.

The Examiner requires applicant to provide that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

The HoB states/teaches that typical lead acid batteries use lead dioxide as the active material of the positive electrode and metallic lead as the negative active material (p 24.6, section 24.2.1., para 001, lines 2-4). These materials are inherently proton conducting. The basis for inherency is shown by reaction mechanisms for lead-acid batteries, wherein protons are exchanged (p 24.7, top of the page). (See above for the Office's policy on inherency.)

The HoB states/teaches that typical lead acid batteries have an electrolyte made of a sulfuric acid solution (aqueous electrolyte) (p24.6, section 24.2.1, para 002). It is inherent that the electrolyte solution provides a proton source and is proton-ionizing. The basis for expected inherency is that the electrolyte of a typical lead-acid battery (sulfuric acid) and that exemplified by the instant application are the same (p 29, lines 17-20). (See above for the Office's policy on inherency.)

Finally, it is noted that HoB states/teaches that lead-acid batteries are secondary batteries (as indicated next to the page number 24.6). Accordingly, each electrode acts as an anode and a cathode during different states of charge and discharge. Accordingly, Hara's teaching reads on the claimed invention, because although the anode is embodied to have the fibers (para 0011), it acts as the cathode during a different state of charge/discharge (as applied to claims 11 and 15).

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

**NOTE:** If it is shown that Hara does not have all of the aspects of a typical lead-acid battery, an alternative obviousness rejection has been made. See the 103 section.

As to claims 12 and 18, the HoB shows that the charge-carrier, protons, is exclusively involved in a redox reaction of the active materials associated with charge/discharge in both electrodes (top of p 24.7).

As to claims 13 and 19, the HoB states/teaches that typical lead acid batteries have an electrolyte made of a sulfuric acid solution (aqueous electrolyte) (p24.6, section 24.2.1, para 002).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 10-15, 18, and 19 are alternately rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0102467(Fitter) as evidenced by HoB and in view of Hara.

As to claims 10, 11, 14, and 15, Fitter teaches a typical lead-acid battery (para 0025) (electrochemical cell, as applied to claims 10 and 11 and storage device, as applied to claims 14 and 15). The positive electrode is active material of lead-dioxide;



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the negative active material is lead, and the electrolyte is water and sulfuric acid (aqueous solution) (para 0026).

It is noted that (a) the positive and negative active material are inherently proton conducting and (b) the electrolyte has a proton source and is proton ionizing.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application bases for expectation of inherency can be drawn. With respect to (a), the HoB is used as an evidentiary piece. The HoB uses lead dioxide as the active material of the positive electrode and metallic lead as the negative active material (p 24.6, section 24.2.1., para 001, lines 2-4) (much like Fitter). The reaction mechanism for lead-acid batteries of these materials is shown in the HoB; protons are exchanged (p 24.7, top of the page). With respect to (b), the basis for

expected inherency is that the electrolyte taught by Fitter (sulfuric acid) is the same as one exemplified by the instant application (p 29, lines 17-20).

The Examiner requires applicant to provide that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Fitter does not teach that (a) at least one of the cathode and anode is an electrode comprises of an anion-exchange resin, wherein the anion-exchange resin is fiber with a length of 10 mm or less and a major axis of 100  $\mu$ m or less (as required by claims 10 and 14) or (b) that the cathode comprises of an anion-exchange resin, wherein the anion-exchange resin is fiber with a length of 10 mm or less and a major axis of 100  $\mu$ m or less (as required by claims 11 and 15).

With respect to (a) and (b), Hara teaches a lead-acid battery wherein the active material of the anode includes a sulfonated polystyrene resin (anion-exchange resin) made of fibers with a diameter (major axis) of 10 micrometers and an average length of 5 mm (abs; para 0011, lines 1-5). The motivation for wanting to include the sulfonated polystyrene resin fiber is that it can raise the conductivity in an active material layer, can raise the active material utilization factor, and raise the capacity of the cell (para 0016).

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Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to include the sulfonated polystyrene resin (anion-exchange resin) in anode of a lead-acid battery in order to improve conductivity, active material utilization, and capacity of the battery. (It is noted that the sulfonated polystyrene resin inherently is an anion exchange resin, wherein the basis of inherency lies in the fact that it is the same material embodied by the instant application. See p 20, lines 12-19 of the instant application.)

Finally, it is noted that with respect to (b), lead-acid batteries are secondary batteries (as indicated by para 0005-0006 of Fitter). Accordingly, each electrode acts as an anode and a cathode during different states of charge and discharge. Accordingly, the combination of Fitter and Hara reads on the claimed invention, because although the anode is embodied to have the fibers (Hara, para 0011), it acts as the cathode during a different state of charge/discharge (as applied to claims 11 and 15).

As to claims 12 and 18, the HoB shows that the charge-carrier, protons, is exclusively involved in a redox reaction of the active materials associated with charge/discharge in both electrodes (top of p 24.7).

As to claims 13 and 19, Fitter teaches that the electrolyte is water and sulfuric acid (aqueous solution) (para 0026).

7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Hara as evidenced by HoB or Fitter evidenced by HoB in view of Hara, as applied to claim 14, in further view of US 5374490 (Aldecoa).

As to claim 16, Fitter, Hara, and HoB do not teach of connecting electrochemical cells in series.

However, Aldecoa teaches of lead acid batteries stacked in series (fig. 4). The motivation for coupling the modules (of lead-acid cells) in series is in order to create a higher potential (col. 3, lines 32-35). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to couple the lead-acid cells in series in order to reach a higher potential.

As to claim 17, Fitter, Hara, and HoB do not teach of stacking the electrochemical cells (in series).

As to claims 17, Aldecoa et al. teaches that stacking the battery modules [10] effectively couples the modules in series, which in turn creates a higher potential (fig. 4; col. 3, lines 32-35). Thus, the motivation for stacking the battery modules would be to connect the modules in series, which in turn creates a higher potential. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to stack the lead-acid cells in order to effectively connect the batteries in series, thus reaching a higher potential.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 10-19 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./  
Examiner, Art Unit 1795

/Gregg Cantelmo/

for E. Wang, Examiner of Art Unit 1795